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AMENDMENTS TO THE CLAIMS

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For the Examiner's convenience, all pending claims are set forth below and have been amended where noted:

- 1) (Original) A process for producing hydrogen, comprising:
  - catalytically reforming a first hydrocarbon portion with steam and air in an autothermal reactor to produce a first syngas effluent at a temperature from 650°C to 1050 °C;
  - supplying the first syngas effluent to a reforming exchanger;
  - passing a second hydrocarbon portion with steam through a catalyst zone in the reforming exchanger to form a second syngas effluent;
  - discharging the second syngas effluent from the catalyst zone adjacent the inlet to form a syngas admixture with the first syngas effluent;
  - passing the admixture across the catalyst zone in indirect heat exchange therewith to cool the admixture and heat the catalyst zone;
  - collecting the cooled admixture from an outlet of the reforming exchanger;
  - shift converting the admixture to obtain a carbon dioxide-rich gas stream lean in carbon monoxide; and
  - separating the carbon dioxide-rich gas stream to form a hydrogen-lean mixed gas stream comprising nitrogen and carbon dioxide and a hydrogen-rich product stream
- 2) (Original) The process of claim 1, wherein the mixed gas separation comprises membrane separation.
- 3) (Original) The process of claim 1, wherein the mixed gas separation comprises pressure swing adsorption.
- 4) (Original) The process of claim 1, wherein the catalyst zone comprises catalyst tubes, the

process further comprising:

supplying the first syngas effluent to a shell-side of the reformer;

supplying the second hydrocarbon portion with steam through the catalyst tubes;

discharging the second syngas effluent from the catalyst tubes adjacent the shell-side inlet to form the syngas admixture.

- 5) (Original) The process of claim 1 wherein the autothermal reformer is operated with excess air.
- 6) (Original) The process of claim 1 wherein the carbon dioxide-rich gas stream from the shift conversion comprises a molar ratio of hydrogen to nitrogen less than 3.
- 7) (Original) The process of claim 1 wherein the mixed gas separation is free of cryogenic separation.
- 8) (Original) The process of claim 1 wherein the process is free of air separation.
- 9) (Original) The process of claim 1 wherein a proportion of the first hydrocarbon portion relative to a total of the first and second hydrocarbon portions is from 55 to 85 percent.
- 10) (Original) The process of claim 1 wherein a proportion of the first hydrocarbon portion relative to a total of the first and second hydrocarbon portions is from 60 to 80 percent.
- 11) (Original) The process of claim 1 wherein the hydrogen product stream has a purity of at least 70 volume percent.
- 12) (Original) The process of claim 11, wherein the hydrogen product stream has a purity of from 90 to 99.5 volume percent.
- 13) (Original) The process of claim 1, wherein the hydrogen product stream has a purity of at least 95 volume percent.
- 14) (Original) The process of claim 1, wherein the hydrogen product stream has a purity of at

least 97 volume percent.

- 15) (Original) The process of claim 1, wherein the hydrogen product stream has a purity of at least 98.5 volume percent.
- 16) (Original) A process for generating an electrical current comprising the process of claim 1 and supplying the hydrogen-rich product stream to a fuel cell.
- 17) (Original) A hydrotreating process comprising the process of claim 1 and supplying the hydrogen-rich product stream to a hydrotreater.
- 18) (Original) Apparatus for preparing syngas, comprising:
  - autothermal reactor means for catalytically reforming a first hydrocarbon portion with steam and air to produce a first syngas effluent at a temperature from 650°C to 1050°C;
  - means for supplying the first syngas effluent to an inlet of a reforming exchanger;
  - means for passing a second hydrocarbon portion with steam through a catalyst zone in the reforming exchanger to form a second syngas effluent;
  - means for discharging the second syngas effluent from the catalyst zone adjacent the inlet to form a syngas admixture with the first syngas effluent;
  - means for passing the admixture across the catalyst zone in indirect heat exchange therewith to cool the admixture and heat the catalyst zone; means for collecting the cooled admixture from an outlet from the reforming exchanger;
  - means for shift converting the admixture to obtain a carbon dioxide-rich gas stream lean in carbon monoxide; and
  - means for separating the carbon dioxide-rich gas stream to form a hydrogen-lean, mixed gas stream comprising nitrogen and carbon dioxide and a hydrogen-rich product stream.
- 19) (Withdrawn) The apparatus of claim 18, wherein the separation means comprise a pressure swing adsorption unit.

- 20) (Withdrawn) The apparatus of claim 18, wherein the separation means comprise a membrane separator.
- 21) (Original) The process of claim 1, wherein the reforming, shift conversion and mixed gas separation comprise a process pressure from 10 to 200 bars.
- 22) (Original) The process of claim 21, wherein the reforming, shift conversion and mixed gas separation comprise a process pressure of at least 30 bars.
- 23) (Original) The process of claim 1, further comprising compressing air to the catalytic reforming with a gas turbine drive and recovering heat from exhaust from the gas turbine.

Applicant believes that no new matter has been added with these amendments.